

REMARKS

Summary of Amendments

Claim 1 has been amended to more particularly point out and distinctly claim Applicant's inventive subject matter. Claims 2-14, which all depend from claim 1, remain in their form as previously presented.

Support for Amendments

In the specification as filed, support for the amendments to claim 1 can be found in particular on page 6, lines 6-9, and in the description of the embodied examples, which starts on page 8, in Embodiments 1-3 and 5.

Claim Rejections – 35 U.S.C. § 103

Claims 1-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Kuibira et al.* (U.S. Pat. No. 6,508,884) in view of *Aonuma et al.* (Japanese Unexamined Pat. App. Pub. No. 2002-252269).

Applicability of *Kuibira et al.* as a § 103(a) reference

Although the Office states that based upon the earlier effective U.S. filing date of *Kuibira et al.*, "it constitutes prior art only under 35 U.S.C. § 102(e)," Applicant's undersigned representative believes that *Kuibira et al.* is applicable as a § 103(a) reference via § 102(a), not "only under 35 U.S.C. § 102(e)."

Specifically, *Kuibira et al.* was published on January 24, 2002, while the instant application has a priority date of October 24, 2002. Because *Kuibira et al.* was published before the presumed date of invention—i.e., the priority date—in the present application, Applicant's undersigned representative understands that the Office may presume that *Kuibira et al.* is applicable as a "§ 102(a) reference."

Applicant's undersigned representative believes that in order to disqualify the applicability of *Kuibira et al.* as a § 103(a) reference, a demonstration would have to be made that the present invention was actually completed prior to January 24, 2002. In that case—but assuming that Applicant's actual completion of invention does not predate the December 19, 2000 *Kuibira et al.* filing date—*Kuibira et al.* would become a § 102(e) reference (published after, but filed before the completion of the present invention), the present § 103(a) rejection would become a § 103(c) rejection, and then the fact that *Kuibira et al.* is commonly assigned with the instant invention would allow Applicant to overcome the present § 103(a) rejection by disqualifying *Kuibira et al.*

§ 103 Rejections Addressed Substantively

Nevertheless, it is respectfully submitted that the issue of the applicability of *Kuibira et al.* as a reference is moot because the present § 103(a) rejections lack a proper *prima facie* basis. To make a proper *prima facie* rejection, Office policy as set forth in MPEP § 2143 requires that a given combination of references must teach each and every element of a rejected claim. In particular, previously presented independent claim 1 recited:

a resistive heating element composed of wiring lines, **the wiring lines being substantially trapezoidal in cross-section**, the wiring lines further defining bottom and inclined lateral sides, in a predetermined configuration provided on either a surface of or inside said ceramic substrate, said resistive heating element being configured so that in section through said wiring lines the smallest angle formed by the bottom and the lateral sides is 5° or greater.

[Emphasis added.]

More important, the applicability of *Kuibira et al.* as a reference has been rendered moot by the present amendments to claim 1. Claim 1 now recites

a resistive heating element composed of wiring lines formed from a conductive paste print-coated in a predetermined configuration on either a surface of or inside said ceramic substrate, the conductive paste of viscosity selected so that as print-coated, the wiring lines take on a substantially trapezoidal form in cross-section, defining bottom and inclined lateral sides, and so that in section through said wiring lines the smallest angle formed by the bottom and the lateral sides is 5° or greater.

Applicants respectfully submit that neither *Kuibira et al.* nor even *Aonuma et al.*, as will be elaborated below, disclose, or even suggest, wiring lines "formed from a conductive paste . . . of viscosity selected so that as print-coated, the wiring lines take on a substantially trapezoidal form in cross-section."

As noted Applicants' March 19, 2007 reply to the previous action by the Office, *Kuibira et al.* only discloses rectangularly shaped wiring lines. On page 4 of the Office's current action, the Examiner agrees, stating, "*Kuibira et al.* does not disclose . . . wiring lines being substantially trapezoidal in cross-section."

On Page 4 of the present Office action, the Examiner goes on to state:

Aonuma et al. discloses . . . a resistive heating element [that] may be oval, capsular or rectangular and is not limited in its cross-sectional shape (Para 0024). Therefore, it would have been obvious to one of ordinary skill in the art to provide resistive heating elements of any shape including trapezoidal having inclined edges in the apparatus of *Kuibira et al.* as taught by *Aonuma et al.* The motivation to provide a trapezoidal shaped heating element having inclined edges is to provide an alternate and equivalent heating element as taught by *Aonuma et al.*

Applicants respectfully beg to differ. Applicants first note that there is no explicit disclosure of a trapezoidal cross-section in *Aonuma et al.* Instead, there is only a vague statement that the cross section is not limited to being an ellipse, capsule or rectangle. Such a statement does not constitute an enabling disclosure or even a suggestion of wiring lines having substantially trapezoidal form in cross-section, as recited in claim 1.

Moreover, Applicants respectfully submit that *Aonuma et al.* show no recognition of the problem faced by Applicants. Applicants were faced with the problem of electrical shorting (or arcing) between adjacent wiring lines. It was discovered that forming the wiring lines so that they have a trapezoidal form in cross-section and an apex angle of greater than 5 degrees advantageously substantially eliminates such shorting. In contrast, *Aonuma et al.* were attempting to gain better control of the thickness and resistance of the heating electrode (para 0007).

Furthermore, Applicants respectfully disagree with the Office's stated position that a "trapezoidal shaped heating element having inclined edges" even constitutes "an alternate and equivalent heating element" to the elliptical, capsular and rectangular shapes disclosed in *Aonuma et al.* In fact, Applicants note that *Aonuma et al.* teach away from a trapezoidal cross-section. In paragraph [0024] of the machine translation, *Aonuma et al.* state that the heating element has a "major-axis" and that this major axis is desirably parallel with the front face of the substrate (lines 3-4 in paragraph 0024). Such a major axis strongly implies a cross-section having a two-dimensional symmetry (i.e., the top half of the cross section is desirably symmetrical with the bottom half). A trapezoid clearly does not satisfy this condition, being wider on the bottom than the top. Thus it is clear that a trapezoid could not be the "alternate and equivalent heating element" referred to by the Examiner. According to *Aonuma et al.* as they teach in paragraph 0024 of their publication, a trapezoidal cross-section would be undesirable.

Thus, it is respectfully submitted that for the reasons set forth above the present § 103(a) rejections lack a proper *prima facie* basis, and that moreover, the cited combination of references fails to arrive at

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a resistive heating element composed of wiring lines formed from a conductive paste print-coated in a predetermined configuration on either a surface of or inside said ceramic substrate, the conductive paste of viscosity selected so that as print-coated, the wiring lines take on a substantially trapezoidal form in cross-section.

Accordingly, Applicants courteously urge that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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